IMPACTED MANDIBULAR THIRD MOLARS: PATTERN OF PRESENTATION AND POSTOPERATIVE COMPLICATIONS

1 AHMAD KHAN, BDS, FCPS
2 UMAR KHITAB, BDS, MSc (London)
3 MOHAMMAD TARIQ KHAN, BDS

ABSTRACT

The purpose of this prospective study was to evaluate the occurrence, characteristics and postoperative complications of impacted mandibular third molars in 260 patients from Oct 2008 to July 2010. Clinical and radiographic examinations were carried out. Data regarding the age, gender, angulations type, depth and width of impactions and postoperative complications were evaluated and analyzed. The age ranged from 17 to 59 years with high frequency occurring in 3rd decade. The common cause for extraction was pericoronitis. Mesioangular impaction was most common (n=124, 48%) followed by vertical (n=90, 34%). Majority of the patients presented with Class IIA (n=84, 32.3%) followed by IA (n=61, 23.5%). Postoperative complications included persistent pain and swelling (16.5%) followed by dry socket (4.2%) and trismus (4.2%). There was a greater risk of developing complications in horizontal and distoangular types, and in Class IIIC and IIIA impactions.

Key Words: Mandibular third molar, angulations, Pell and Gregory classification, postoperative complications

INTRODUCTION

Mandibular third molars are the most frequently impacted teeth in human and surgical extractions have become one of the commonest dentoalveolar surgery. Deficient space in the dental arch, an aberrant path of eruption and late eruption sequence are the main etiological factors. Impacted third molars often present with pericoronitis, caries of adjacent teeth, cystic lesions, neoplasms and pathologic root resorptions. Studies have shown that impacted third molar weakens the angle of mandible and makes it susceptible to fracture. Impacted teeth have been implicated in the etiology of lower arch crowding, TMJ disorders, vague orofacial pain and neuralgias. The position of an impacted third molar can be classified radio-graphically according to the anterior-posterior space between the second molar and the mandibular ramus, its superior-inferior position, its medial lateral position in the body of the mandible and the position of its long axis. Such classification helps in communication among the surgeons, record keeping and treatment planning.

Many impacted mandibular third molars remain asymptomatic for years, but are often extracted to prevent the development of future complications and pathologic conditions. Many surgeons in North America consider the prophylactic removal of fully impacted teeth as the ideal approach. Surgical removal is the ultimate treatment of the most impacted mandibular third molars. This involves either simple forceps extraction or complex surgical procedure involving soft tissue reflection, bone removal, tooth sectioning, luxation and elevation of tooth, debridement of the socket and wound closure. Before any procedure, the patient must be informed of the reason for the surgery and the associated risks.

The most common complications following mandibular third molar surgery include dry socket, infec-
Impacted mandibular third molars: Pattern of presentation

Less common complications are severe trismus, iatrogenic damage to adjacent tooth and mandibular fracture. Complications related to third molar removal range from 4.6% to 30.9%, and may occur intraoperatively or develop in the postoperative period. Most of these complications are temporary, but in some cases paresthesia may become permanent causing functional problems.

Several factors have been associated with the occurrence of postoperative complications. These include age, gender, medical history, oral contraceptive, presence of pericoronitis, poor oral hygiene, smoking, degree of impaction, relationship of third molar to inferior alveolar canal, experience of the surgeon, surgical time and technique, peri-operative antibiotics and anesthetic technique.

METHODOLOGY

This study was undertaken on 260 patients, at oral and dental unit Category-D Hospital Mardan from Oct 2008 to July 2010. Patients diagnosed with impacted mandibular third molars and treated surgically under local anesthesia were included in the study. Patients having incomplete root formation of third molar and absence of adjacent second molar were excluded. With the consent of the patients all the necessary information about the variables of the study written in preformed proforma were obtained through history, clinical examination and radiographic study. The position of the impacted mandibular third molar was determined by periapical radiograph and when necessary was supplemented by an orthopantomogram. The depth of impacted third molar in relation to occlusal plane (Class A, B, C) was recorded along with the distance or width between the vertical ascending mandibular ramus and the distal surface of the second molar (Class I, II, III) according to the classification of Pell and Gregory. The angulation of impacted third molar was documented based on Winter’s classification with reference to the angle formed between the intersected longitudinal axes of the second and third molars. These classifications were used to predict the surgical difficulty and evaluate the risk of postoperative complications. Postoperatively, patients were followed for normal healing, persistent pain and swelling, infection of the surgical site, dry socket, trismus, paresthesia and ulceration. The data obtained were evaluated and analyzed by applying descriptive statistics.

RESULTS

Among 260 patients, 119 were male and 141 were female (Fig 1). The age ranged from 17 to 59 years with a mean value 24.5 years. Most common age group involved was 3rd decade (n=149, 57.4%) followed by 4th decade (n=54, 20.8%), (Table 1). Mesioangular impaction was most common (n=124, 48%) followed by vertical (n=90, 34%) and horizontal impaction (n=26, 10%), (Table 2). Majority of the patients presented with Class IIA (n=84, 32.3%) followed by IA (n=61, 23.5%) while there were only 2 patients (0.7%) in Class IIIC (Table 3).

Overall, the postoperative complication rate was 32.5%. Persistent pain and swelling was the common complication in mesioangular, vertical and horizontal type of impaction which was 17%, 16.5% and 15.3% respectively. Trismus and dry socket occurred with
equal frequency (4.2%) and was common in mesioangular followed by horizontal impactions. Paresthesia of the inferior alveolar nerve occurred in two patients (0.7%), (Table 4).

While evaluating the postoperative complications regarding the width and depth of impaction, pain and swelling was common in IIIA (37.5%) followed by IIIB (20%). Dry socket was common in IIIA, IA and IIA which was 12.5%, 5% and 4.8% respectively. Trismus occurred more in Class IIIB (20%), Class IIIA (12.5%) and Class IB (6.8%). Paresthesia was least common and occurred in 2 patients (0.7%), (Table 5).

**TABLE 1: AGE DISTRIBUTION OF PATIENTS**

<table>
<thead>
<tr>
<th>Age groups (Years)</th>
<th>No. of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>11-20</td>
<td>23</td>
<td>8.9</td>
</tr>
<tr>
<td>21-30</td>
<td>149</td>
<td>57.4</td>
</tr>
<tr>
<td>31-40</td>
<td>54</td>
<td>20.8</td>
</tr>
<tr>
<td>41-50</td>
<td>27</td>
<td>10.3</td>
</tr>
<tr>
<td>Over 50 years</td>
<td>7</td>
<td>2.6</td>
</tr>
</tbody>
</table>

**TABLE 2: POSITION OF IMPACTED MANDIBULAR THIRD MOLARS (WINTER CLASSIFICATION)**

<table>
<thead>
<tr>
<th>Angulations</th>
<th>No of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mesioangular</td>
<td>124</td>
<td>48</td>
</tr>
<tr>
<td>Vertical</td>
<td>90</td>
<td>34</td>
</tr>
<tr>
<td>Horizontal</td>
<td>26</td>
<td>10</td>
</tr>
<tr>
<td>Distoangular</td>
<td>15</td>
<td>6</td>
</tr>
<tr>
<td>Others</td>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>

**TABLE 3: DISTRIBUTION OF IMPACTED MANDIBULAR THIRD MOLARS ACCORDING TO THE DEPTH AND WIDTH OF IMPACTION**

**Pell and Gregory classification of impaction**

<table>
<thead>
<tr>
<th>Classification</th>
<th>IA</th>
<th>IB</th>
<th>IC</th>
<th>IIA</th>
<th>IIB</th>
<th>IIC</th>
<th>IIIA</th>
<th>IIIB</th>
<th>IIIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of patients</td>
<td>61</td>
<td>29</td>
<td>7</td>
<td>84</td>
<td>58</td>
<td>6</td>
<td>8</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Percentage</td>
<td>23.5</td>
<td>11</td>
<td>2.5</td>
<td>32.3</td>
<td>22.3</td>
<td>2.3</td>
<td>3</td>
<td>2</td>
<td>0.7</td>
</tr>
</tbody>
</table>

**TABLE 4: POSTOPERATIVE COMPLICATIONS ACCORDING TO POSITION OF MANDIBULAR THIRD MOLARS (WINTER CLASSIFICATION)**

<table>
<thead>
<tr>
<th>POSTOPERATIVE COMPLICATIONS</th>
<th>MA (n=124)</th>
<th>Vertical (n=90)</th>
<th>Horizontal (n=26)</th>
<th>DA (n=15)</th>
<th>Others (n=5)</th>
<th>Total (n=260)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain and swelling</td>
<td>21</td>
<td>15</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>43 (16.5%)</td>
</tr>
<tr>
<td>Dry socket</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>11 (4.2%)</td>
</tr>
<tr>
<td>Infection</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>8 (3%)</td>
</tr>
<tr>
<td>Trismus</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>11 (4.2%)</td>
</tr>
<tr>
<td>Paresthesia</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2 (0.7%)</td>
</tr>
<tr>
<td>Ulceration</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>10 (3.8%)</td>
</tr>
<tr>
<td>Total</td>
<td>37</td>
<td>24</td>
<td>14</td>
<td>7</td>
<td>3</td>
<td>85 (32.5%)</td>
</tr>
</tbody>
</table>

MA=Mesioangular, DA=Distoangular
**DISCUSSION**

Mandibular third molar impaction is a common problem affecting a large proportion of population. The predominant age group in this study was the third decade of life which correlates with the previous studies. Thus more than half of the patients were in the third decade of their lives. This decline in number of impactions with increasing age is due to their operative removal. In contrast to the previous studies, higher proportions of patients (13%) were older than 40 years. This may be due to the fact that lack of oral health awareness leads to unnecessary delay in treatment in these patients. This study also revealed that impaction of mandibular third molar was common in female, and this finding was in agreement to previous reports about the gender distribution.

Mesioangular impaction (48%) followed by vertical (34%) was the common type in the current study. Our findings conformed with the previous reports from Pakistan, USA, Nigeria, China, Thailand, Spain and Malaysia, where the common type was mesioangular impactions. However, a study among Jordanians found that vertical impactions were the most common (61.4%) and mesioangular were only 18%. Similarly, another study in Barcelona had also reported that vertical impactions were the common type followed by mesioangular. It appears that mesioangular impactions are probably the commonest type and this may be due to their late development and maturation, path of eruption and lack of space in mandible at later age.

The common type of impaction regarding the Pell and Gregory classification was IIA (n=84, 32.3%) followed by IA (n=61, 23.5%). These findings are in accordance with the results of previous studies. Among Nigerians, Obiechina et al reported the common Class as IIA (31%), while Monaco et al also identified the commonest position as Class A (56.2%) and Class II (63%) in Italian population. A study by Jaffar et al from Malaysia also observed that the common Class was IIA (45.7%) followed by IA (22.3%), while Blondeau et al from Canada and Almendros-Marques et al from Spain reported Class IIB as the common position of mandibular third molar. This difference may be due to the fact that our population uses fibrous diet which promotes jaw growth and circumferential attrition of teeth providing some space for the erupting third molars. Genetic and racial differences are also other important considerations.

Pericoronitis was the most common reason for the surgical removal of mandibular third molars in this study. Other studies across the world have also shown that pericoronitis is the most common pathology associated with impacted third molars. Adeyemo et al found that caries was the main reason for extraction followed by pericoronitis and periodontitis. Studies have demonstrated that vertical and Class A impaction have high potential for developing of pericoronitis.
Third molar surgery is not risk free, postoperatively, it may cause pain and swelling, dry socket, infection, trismus, damage to lingual and inferior alveolar nerve (IAN), dentoalveolar fracture, ulcerations, injury to adjacent tooth, temporomandibular joint injury and mandibular fracture. The most common complication noted was persistent pain and swelling (n=43, 16.5%) followed by dry socket (4.2%) and trismus (4.2%). Surgical removal of mandibular third molar is often associated with postoperative pain, swelling, trismus and ulcerations. Some authors do not consider them as complications because they are expected and transient. Pain can have a significant effect on the patient's quality of life. Factors that influence the pain sensation include age, sex, status of oral hygiene, anxiety and surgical difficulty. Good oral hygiene measures and chlorhexidine 0.12% mouth washes before and 24 hours after the surgery can minimize these kind of problems.

Dry socket is a clinical diagnosis characterized by the development of severe throbbing pain several days after the removal of a tooth and is often accompanied by halitosis. The reported incidence of dry socket varies widely, from as low as 0.5% to as high as 68.4%, but most studies indicate a rate between 5% and 10%. In the present study dry socket represented just 4.2% of the total complications. Blondeau et al had reported 3.6% dry socket in their study, while Jaffar et al had found only 3% in their investigation. The results of the current study coincide well with the previous studies.

Neurological damage of the lingual or IAN is one of the least desired complications of third molar surgery. The incidence of IAN and lingual nerve injuries reported, ranges from 0.4% to 22% and most of these injuries undergo spontaneous recovery. In this study two cases of injury to the IAN occurred accounting for 0.7%. Risk factors as regards to damage to IAN are the depth of impaction and dental proximity to alveolar canal. No case of lingual damage was noted because lingual mucosa was not reflected during all surgical procedures.

Postoperative infection rate reported in the literature varies from 1.5% to 5.8%. In the present study the infection rate was 3%, though all the patients had received antibiotics postoperatively. Our findings are consistent with previous reports. These patients were treated conservatively.

There was also a relation between tooth position based on Winter Classification and the appearance of postoperative complications. Distoangular and vertical impaction had the highest number of complications than other types in the present study. Blondeau et al had reported that distoangular impactions had highest rate of complications, while Jaffar et al reported that vertical impactions had the highest rate of complications. Similarly, our results showed that the teeth in Class IIIC, IIIB and IIIA had more complications rate. Deeper impaction leading to greater likelihood of soft and hard tissue disturbance and longer operation time, which put these patients at risk to develop more postoperative complications.

CONCLUSION

Most common age group involved in impacted mandibular third molar was 3rd decade of life. Mesioangular and Class IIA impaction was most common. The common cause of third molar extraction was pericoronitis. Persistent pain and swelling was common complication followed by dry socket and trismus. Horizontal and distoangular impactions are inclined to develop more complications. Impaction depth IIIC and IIIB also causes more complications.

REFERENCES


